

## Concentric rings of gravity waves in the mesosphere observed by the OMTI network in Japan

Shin Suzuki<sup>1\*</sup>, Kazuo Shiokawa<sup>1</sup>, Yuichi Otsuka<sup>1</sup>

<sup>1</sup>Solar-Terrestrial Environment Laboratory, Nagoya University

Atmospheric gravity waves significantly contribute to the wind/thermal balances in the mesosphere and lower thermosphere (MLT) through their vertical transport of horizontal momentum. It has been reported that the gravity wave momentum flux preferentially associated with the scale of the waves; the momentum fluxes of the waves with a horizontal scale of 10-100 km are particularly significant.

Airglow imaging is a useful technique to observe two-dimensional structure of small-scale (<100 km) gravity waves in the MLT region and has been used to investigate global behaviour of the waves. Solar-Terrestrial Environment Laboratory, Nagoya University has made long-term airglow imaging observations in the world using the Optical Mesosphere and Thermosphere Imager (OMTI) system. On 10 December 2002, concentric rings of gravity waves were observed simultaneously by all-sky imagers of OMTI in Japan located at Shigaraki (34.9N, 136.1E), and Rikubetsu (43.5N, 143.8E). The airglow structures, which were well-defined and formed a coherent wave pattern expanding from the southeast, were identified over 8 hours (1235-2047 UT or 2135-2947 LT). This unique event will give us new insight into the lower and upper atmosphere coupling.

In the presentation, we will report initial results on the concentric gravity waves on 10 December 2002 and discuss their possible source in the lower atmosphere.